



Assignment

Indices

Basic Level

1. $a^{m \log_a n} =$
 - (a) a^{mn}
 - (b) m^n
 - (c) n^m
 - (d) None of these
2. If $(a^m)^n = a^{m^n}$, then the value of 'm' in terms of 'n' is
 - (a) n
 - (b) $n^{1/m}$
 - (c) $n^{1/(n-1)}$
 - (d) None of these
3. $(x^5)^{1/3}(16x^3)^{2/3}\left(\frac{1}{4}x^{4/9}\right)^{-3/2} =$
 - (a) $(x/4)^3$
 - (b) $(4x)^3$
 - (c) $8x^3$
 - (d) None of these
4. If $a^{1/x} = b^{1/y} = c^{1/z}$ and $b^2 = ac$ then $x + z =$
 - (a) y
 - (b) $2y$
 - (c) $2xyz$
 - (d) None of these
5. If $a^x = bc, b^y = ca, c^z = ab$, then $xyz =$
 - (a) 0
 - (b) 1
 - (c) $x + y + z$
 - (d) $x + y + z + 2$
6. If $a^x = (x + y + z)^y, a^y = (x + y + z)^z, a^z = (x + y + z)^x$, then
 - (a) $x = y = z = a/3$
 - (b) $x + y + z = a/3$
 - (c) $x + y + z = 0$
 - (d) None of these
7. If $a^{x-1} = bc, b^{y-1} = ca, c^{z-1} = ab$, then $\sum (1/x) =$
 - (a) 1
 - (b) 0
 - (c) abc
 - (d) None of these
8. If $\frac{(2^{n+1})^m (2^{2n})2^n}{(2^{m+1})^n 2^{2m}} = 1$, then $m =$
 - (a) 0
 - (b) 1
 - (c) n
 - (d) $2n$
9. If $x^y = y^x$, then $(x/y)^{(x/y)} = x^{(x/y)-k}$, where $k =$
 - (a) 0
 - (b) 1
 - (c) -1
 - (d) None of these
10. If $x^{x\sqrt[3]{x}} = (x \cdot \sqrt[3]{x})^x$, then $x =$
 - (a) 1
 - (b) -1
 - (c) 0
 - (d) $64/27$
11. If $a^x = b^y = (ab)^{xy}$, then $x + y =$
 - (a) 0
 - (b) 1
 - (c) xy
 - (d) None of these
12. If $x = 2^{1/3} - 2^{-1/3}$, then $2x^3 + 6x =$
 - (a) 1
 - (b) 2
 - (c) 3
 - (d) None of these

16 Indices and Surds

13. If $x = 2 + 2^{2/3} + 2^{1/3}$, then the value of $x^3 - 6x^2 + 6x$ is
 (a) 3 (b) 2 (c) 1 (d) None of these
14. Solution of the equation $(x)^{x\sqrt{x}} = (x\sqrt{x})^x$ are
 (a) $9/4$ (b) 1 (c) -1 (d) 0
15. If $5^{x-1} + 5 \cdot (0.2)^{x-2} = 26$, then x may have the value
 (a) 25 (b) 1 (c) 3 (d) None of these

Advance Level

16. $\sum \frac{1}{1+x^{a-b}+x^{a-c}} =$
 (a) 1 (b) -1 (c) 0 (d) None of these
17. Let $\frac{7}{2^{1/2}+2^{1/4}+1} = A + B \cdot 2^{1/4} + C \cdot 2^{1/2} + D \cdot 2^{3/4}$, then
 (a) $A=1$ (b) $B=3$ (c) $C=2$ (d) $D=1$
18. Solution of the equation $4 \cdot 9^{x-1} = 3\sqrt{2^{2x+1}}$ has the solution
 (a) 3 (b) 2 (c) $3/2$ (d) $2/3$
19. Solution of the equation $9^x - 2^{\frac{x+3}{2}} = 2^{\frac{x+3}{2}} - 3^{2x-1}$
 (a) $\log_9(9/\sqrt{8})$ (b) $\log_{(9/2)}(9/\sqrt{8})$ (c) $\log_e(9/\sqrt{8})$ (d) None of these

Surds

Basic Level

20. If $a > 0$, then $\sqrt{a + \sqrt{a + \sqrt{a + \dots \infty}}}$ is
 (a) $\frac{1}{2}\sqrt{4a-1}$ (b) $\frac{1}{2}[1 + \sqrt{4a+1}]$ (c) $\frac{1}{2}[1 - \sqrt{4a-1}]$ (d) $\frac{1}{2}[1 \pm \sqrt{4a+1}]$
21. $\frac{[4 + \sqrt{(15)}]^{3/2} + [4 - \sqrt{(15)}]^{3/2}}{[6 + \sqrt{(35)}]^{3/2} - [6 - \sqrt{(35)}]^{3/2}} =$
 (a) 1 (b) $7/13$ (c) $13/7$ (d) None of these
22. If $x = \frac{\sqrt{5} + \sqrt{2}}{\sqrt{5} - \sqrt{2}}$, $y = \frac{\sqrt{5} - \sqrt{2}}{\sqrt{5} + \sqrt{2}}$, then $3x^2 + 4xy - 3y^2 =$
 (a) $\frac{1}{3}[56\sqrt{10} - 12]$ (b) $\frac{1}{3}[56\sqrt{10} + 12]$ (c) $\frac{1}{3}[56 + 12\sqrt{10}]$ (d) None of these
23. $\frac{12}{3 + \sqrt{5} - 2\sqrt{2}} =$
 (a) $1 + \sqrt{5} + \sqrt{(10)} + \sqrt{2}$ (b) $1 + \sqrt{5} - \sqrt{(10)} + \sqrt{2}$ (c) $1 + \sqrt{5} + \sqrt{(10)} - \sqrt{2}$ (d) $1 - \sqrt{5} - \sqrt{2} + \sqrt{(10)}$

24. $\frac{1}{\sqrt{(11-2\sqrt{30})}} - \frac{3}{\sqrt{(7-2\sqrt{10})}} - \frac{4}{\sqrt{(8+4\sqrt{3})}} =$
 (a) 0 (b) -1 (c) 1 (d) None of these
25. $\frac{\sqrt{(5/2)} + \sqrt{(7-3\sqrt{5})}}{\sqrt{(7/2)} + \sqrt{(16-5\sqrt{7})}} =$
 (a) Rational (b) Surd (c) Multiple of $\sqrt{7}$ (d) None of these
26. $\frac{\sqrt{2}}{\sqrt{(2+\sqrt{3})} - \sqrt{(2-\sqrt{3})}} =$
 (a) 0 (b) 1 (c) $\sqrt{2}$ (d) $1/\sqrt{2}$
27. $\frac{4}{1+\sqrt{2}-\sqrt{3}} =$
 (a) $2+\sqrt{2}+\sqrt{6}$ (b) $1+\sqrt{2}+\sqrt{3}$ (c) $3+\sqrt{2}+\sqrt{3}$ (d) None of these
28. $\frac{3\sqrt{2}}{\sqrt{6}+\sqrt{3}} - \frac{4\sqrt{3}}{\sqrt{6}+\sqrt{2}} + \frac{\sqrt{6}}{\sqrt{3}+\sqrt{2}} =$
 (a) $5\sqrt{2}$ (b) $3\sqrt{2}$ (c) $2\sqrt{3}$ (d) 0
29. If $\frac{4+3\sqrt{3}}{\sqrt{(7+4\sqrt{3})}} = a + \sqrt{b}$, then $(a, b) =$
 (a) (12, 1) (b) (1, 12) (c) (-1, 12) (d) (-12, 1)
30. The rationalising factor of $2\sqrt{3} - \sqrt{7}$ is
 (a) $\sqrt{3} + \sqrt{7}$ (b) $2\sqrt{3} + \sqrt{7}$ (c) $\sqrt{3} + 2\sqrt{7}$ (d) None of these
31. The square root of $134 + \sqrt{(6292)}$ is
 (a) $21 + \sqrt{(13)}$ (b) $11 + \sqrt{(13)}$ (c) $13 + \sqrt{(11)}$ (d) $13 + \sqrt{(21)}$
32. The value of $\sqrt{[12 - \sqrt{(68 + 48\sqrt{2})}]}$ =
 (a) $2 + \sqrt{2}$ (b) $2 - \sqrt{2}$ (c) $\sqrt{2} - 1$ (d) None of these
33. The square root of $\sqrt{(50)} + \sqrt{(48)}$ is
 (a) $2^{1/4}(3 + \sqrt{2})$ (b) $2^{1/4}(\sqrt{3} + 2)$ (c) $2^{1/4}(2 + \sqrt{2})$ (d) $2^{1/4}(\sqrt{3} + \sqrt{2})$
34. $\sqrt{(3+\sqrt{5})} - \sqrt{(2+\sqrt{3})} =$
 (a) $\sqrt{(5/2)} + \sqrt{(3/2)}$ (b) $\sqrt{(5/2)} - \sqrt{(3/2)}$ (c) $\sqrt{(5/2)} - \sqrt{(1/2)}$ (d) $\sqrt{(3/2)} - \sqrt{(1/2)}$
35. The value of $\sqrt{[12\sqrt{5} + 2\sqrt{(55)]}}$ is
 (a) $5^{1/2}[\sqrt{(11)} + 1]$ (b) $5^{1/2}[\sqrt{(11)} - 1]$ (c) $5^{1/4}[\sqrt{(11)} + 1]$ (d) $5^{1/4}[\sqrt{(11)} - 1]$
36. The cube root of $9\sqrt{3} + 11\sqrt{2}$ is
 (a) $2\sqrt{3} + \sqrt{2}$ (b) $\sqrt{3} + 2\sqrt{2}$ (c) $3\sqrt{3} + \sqrt{2}$ (d) $\sqrt{3} + \sqrt{2}$

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37. If $x + \sqrt{x^2 + 1} = a$, then $x =$
(a) $\frac{1}{2}(a + 1/a)$ (b) $\frac{1}{2}(a - 1/a)$ (c) $(a + a^{-1})$ (d) None of these
38. If $x = \sqrt{7} + \sqrt{3}$ and $xy = 4$, then $x^4 + y^4 =$
(a) 400 (b) 368 (c) 352 (d) 200
39. If $x = 2 + \sqrt{3}$, $xy = 1$, then $\frac{x}{\sqrt{2} + \sqrt{x}} + \frac{y}{\sqrt{2} - \sqrt{y}} =$
(a) $\sqrt{2}$ (b) $\sqrt{3}$ (c) 1 (d) None of these
40. If $x = 3 - \sqrt{5}$, then $\frac{\sqrt{x}}{\sqrt{2} + \sqrt{(3x-2)}} =$
(a) 5 (b) $\sqrt{5}$ (c) $1/5$ (d) $1/\sqrt{5}$
41. If $a = \sqrt{21} - \sqrt{20}$ and $b = \sqrt{18} - \sqrt{17}$, then
(a) $a = b$ (b) $a + b = 0$ (c) $a > b$ (d) $a < b$
42. Solution of the equation $\sqrt{x+10} + \sqrt{x-2} = 6$ are
(a) 0 (b) 6 (c) 4 (d) None of these

Advance Level

43. Let $u_n = \frac{1}{\sqrt{5}} \left[\left(\frac{1+\sqrt{5}}{2} \right)^n - \left(\frac{1-\sqrt{5}}{2} \right)^n \right]$, $n = 0, 1, 2, \dots$ then
(a) $u_{n+1} = u_n + u_{n-1}$ (b) $u_{2n-1} = u_n^2 + u_{n-1}^2$ (c) $u_{n+2} = u_n + u_{n+1}$ (d) None of these
44. $\sqrt{[6 + 2\sqrt{3} + 2\sqrt{2} + 2\sqrt{6}]} - 1/\sqrt{5 + 2\sqrt{6}} =$
(a) 1 (b) -1 (c) 0 (d) None of these
45. $\sqrt{[x + 2\sqrt{x(x-1)}]} + \sqrt{[x - 2\sqrt{x(x-1)}]} =$
(a) 2, if $1 \leq x \leq 2$ (b) 2, if $x > 2$ (c) $2\sqrt{x-1}$, if $1 \leq x \leq 2$ (d) $2\sqrt{x-1}$, if $x > 2$
